



AZ COMP COMMISSION

July 24, 2000

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Arizona Corporation Commission DOCKETED

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Re:

Docket No. E-01933A-00-0486

IN THE MATTER OF THE APPLICATION OF APS ENERGY SERVICES, INC. FOR DECLARATORY ORDER OR WAIVER OF THE ELECTRIC

COMPETITION RULES

Dear Sir/Madam:

Pursuant to the Commission Procedural Order dated July 7, 2000 attached is the direct testimony of Kevin Higgins on behalf of APS Energy Services.

If you have questions please call me at (602) 774-5348.

Sincerely,

Barbara A. Klemstine

Director, Regulatory Affairs

Page Two

Re: Docket No. E-01933A-00-0486

Copies of the foregoing mailed the 24th day of July 2000 to:

Jane L. Rodda ADMINISTRATIVE LAW JUDGE 400 West Congress Street Tucson, AZ 85701

Raymond Heyman ROSHKA, HEYMAN, & DEWULF, PLC. Two Arizona Center 400 North 5th Street Suite 1000 Phoenix, AZ 85004

Thomas Thompson UNIVERSITY OF ARIZONA ATTORNEY'S OFFICE U of A Admin Bldg., Room 103 P.O. Box 210066 Tucson, AZ 85721-0066

By

BEFORE THE ARIZONA CORPORATION COMMISSION

CARL J. KUNASEK
CHAIRMAN
JIM IRVIN
COMMISSIONER
WILLIAM A. MUNDELL
COMMISSIONER

IN THE MATTER OF THE APPLICATION OF APS ENERGY SERVICES, INC. FOR DECLARATORY ORDER OR WAIVER OF THE ELECTRIC COMPETITION RULES.

DOCKET NO. E-01933A-00-0486

DIRECT TESTIMONY OF KEVIN C. HIGGINS

on Behalf of APS Energy Services Corporation, Inc.

July 24, 2000

DIRECT TESTIMONY OF KEVIN C. HIGGINS (DOCKET NO. E-01933A-00-0486)

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23 24 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

My name is Kevin C. Higgins, and my business address is 39 Market Street, Suite 200, A. Salt Lake City, Utah 84101.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

I am a principal with Energy Strategies, LLC. Energy Strategies is a private consulting A. firm specializing in the economic and policy analysis applicable to energy production, transportation, and consumption.

ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING? Q.

I am a consultant to the University of Arizona ("University"). My testimony is being A. sponsored by APS Energy Services Corporation, Inc. ("APS Energy Services").

Q. WHAT ARE YOUR QUALIFICATIONS TO TESTIFY IN THIS PROCEEDING?

My academic background is in economics, and I have completed all course work and A. examinations toward the Ph.D. in Economics at the University of Utah, and have served on the adjunct faculties of both the University of Utah and Westminster College. Since 1997, I have been very involved in the implementation of retail access in Arizona, and helped to negotiate a comprehensive resolution of stranded cost, unbundled rates, standard offer rate reductions, and transmission access provisions in the Arizona Public Service Company ("APS"), Tucson Electric Power Company ("TEP"), and Salt River Project ("SRP") distribution territories. I also serve on the Board of the Arizona Independent Scheduling Administrator Association, which was formed under Arizona Corporation Commission ("Commission") direction to oversee non-discriminatory access to the transmission system for retail access transactions. In addition, I serve as an ex-officio

member of the Board of Directors of Desert STAR, the Regional Transmission Organization being developed to serve the Southwestern United States.

Prior to joining Energy Strategies, I held policy positions in state and local government. From 1983 to 1990, I was economist, then assistant director, for the Utah Energy Office, where I testified regularly before the Utah Public Service Commission on matters involving structural change in the provision of energy services, including introduction of retail competition in the natural gas industry, implementation of rules governing small power production and cogeneration, joint ownership of electric transmission facilities, and the merger between major electric utilities. From 1991 to 1994, I was chief of staff to the chairman of the Salt Lake County Commission, where I was responsible for development and implementation of a broad spectrum of public policy. A more detailed description of my qualifications is contained in Exhibit KCH-1, attached to this testimony.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY TODAY?

A. My testimony addresses the dispute between TEP on the one hand, and APS Energy
Services and the University on the other hand, over the terms and conditions under which
the University can take direct access service. In my opinion, TEP has erected two major
obstacles that are unfairly impeding the ability of the University to avail itself of direct
access. These obstacles are: (1) rate discrimination and (2) onerous and unnecessary
metering requirements. I recommend that the Commission order TEP to stop obstructing
the University's exercise of customer choice and to permit the University to take direct
access service by resolving the two disputed issues in the manner I propose in this
testimony.

Background

Q. WHAT IS THE RELATIONSHIP BETWEEN ENERGY STRATEGIES AND THE UNIVERSITY?

A. Energy Strategies has a consulting relationship with the University. Energy Strategies has assisted the University in issuing and evaluating the responses to a Request for Proposals ("RFP") for energy efficiency and direct access services. Based on our evaluation of the proposals submitted to the RFP, Energy Strategies recommended that the University contract with APS Energy Services for the energy efficiency and direct access service.

Q. WHAT IS THE RELATIONSHIP BETWEEN ENERGY STRATEGIES AND APS ENERGY SERVICES?

A. As an independent consultant to end-use customers, Energy Strategies has no relationships, financial or otherwise, with any Electric Service Providers, including APS Energy Services. Regarding this matter before the Commission, Energy Strategies and APS Energy Services are working jointly to resolve the problems created by TEP's obstructionist posture toward the University's attempt to take direct access service. Energy Strategies is seeking resolution of this problem in our role as consultant to the University. APS Energy Services is seeking resolution in its role as the potential competitive supplier to the University and to other potential customers in the TEP distribution territory.

Q. PLEASE DESCRIBE THE PRESENT BUNDLED ELECTRIC SERVICES PROVIDED BY TEP TO THE UNIVERSITY.

A. The University is not considered as a single customer by TEP. Rather, the University is served from three different substations. The portion of the University served from each substation is subject to a separate contract with TEP under Standard Offer Rate 14. These three areas within the Tucson campus are referred to as Arizona Health Science Center ("AHSC"), which includes the University Medical School and University Medical Center ("UMC"); Main Campus; and the Central Refrigeration Building ("CRB"), which provides air conditioning to University facilities. The University owns and operates the distribution system within the Tucson campus for the above areas, with the exception of the CRB.

Q. WHAT IS THE RELATIONSHIP BETWEEN THE AHSC AND THE UMC?

A. Technically, the AHSC is the UMC's "landlord." The UMC is privately-owned, but is integrally involved in the medical education and research functions of the University. The two share some common facilities, and the UMC is served electricity through University-owned facilities. As indicated in the original Petition, the UMC is more than willing to cooperate in the efforts of the University to take at least the AHSC portion of the Tucson campus to Direct Access.

Rate Discrimination

Q. PLEASE DESCRIBE THE FIRST OBSTACLE TO DIRECT ACCESS SERVICE THAT TEP HAS ERECTED.

A. In response to the University's stated interest in pursuing direct access, TEP has threatened to force part of the University's load onto a more costly rate schedule than the University is on today. Specifically, all of the University's load today is served on Rate 14, TEP's lowest-priced Standard Offer tariff. It is the University's intention to take its direct access service at the AHSC by utilizing the direct access counterpart to this rate, DA-14, which has the same character of service requirements as TEP's (Standard Offer) Rate 14. In response, however, TEP has told the University that some of its load may be forced onto DA-13, which is significantly more expensive than DA-14. APS Energy Services has estimated this cost impact to be over \$400,000. This cost impact is so severe that moving to DA-13 would destroy the economic benefit to the University from taking direct access service. This consequence appears to be TEP's intent.

Q. WHAT JUSTIFICATION HAS TEP OFFERED FOR THIS OBSTACLE?

A. Both Rate 14 and DA-14 require that the load served be at least 3 mW. The University's load at the AHSC is well over this amount, but due to TEP's delivery system design, the AHSC campus is served by five feeder lines exiting its dedicated substation. Most of the individual feeder lines are delivering less than 3 mW. TEP is using this circumstance as a

pretext to threaten to bill the usage on the feeders that deliver less than 3 mW on DA-13 – even though the load served by these same feeders is billed today on Rate 14.

Q. ON WHAT BASIS IS THE ENTIRE LOAD BILLED ON RATE 14 TODAY?

A. Under the provisions of the University's contract with TEP, and as provided for in the Rate 14 (and DA-14) tariff, the AHSC load is "totalized." That is, it is treated as a single delivery point for billing purposes. The Main Campus portion of the University is also served by multiple feeders off its substation and is likewise billed on a totalized basis.

Q. IS IT UNUSUAL FOR A UTILITY TO SERVE A SINGLE LOAD THROUGH MULTIPLE FEEDERS?

A. Not really. Although these five feeders could have been combined into one larger feeder, thus providing the AHSC with a single delivery point, this likely would have required special facilities construction by TEP due to the size of the load. It is not uncommon for a utility to break one large load into several smaller pieces so that standard components can be used for the pieces rather than custom-build a single delivery point. This saves on investment in facilities. It is not a reason for treating the load as if it were five separate customers for billing purposes.

Q. WHAT IS YOUR OPINION REGARDING TEP'S POSITION AND BEHAVIOR ON THIS QUESTION?

A. The message TEP is sending the University is that its long-term status as a Rate 14 series customer will be jeopardized if the University seeks direct access service, because TEP may then retaliate by abrogating the totalization arrangement that has been in effect for many years. Abrogation of the totalization arrangement would have the effect of forcing the customer onto a higher-cost rate schedule.

TEP's behavior is a textbook example of market power abuse being exercised by a vertically-integrated monopolist. It is this very type of discrimination that regulators across the country are taking great pains to prevent as electricity markets become

increasingly competitive. In Arizona, TEP's posturing is a flagrant violation of the principles of non-discrimination in the Commission's competition rules and also violates TEP's Settlement Agreement with customers approved by the Commission in Decision No. 62103 on November 30, 1999.

Q. HOW DOES TEP'S BEHAVIOR VIOLATE THE COMMISSION'S RULES?

- A. R14-2-1609 states: "The Affected Utilities shall provide non-discriminatory open access to transmission and distribution facilities to serve all customers. No preference or priority shall be given to any distribution customer based on whether the customer is purchasing power under the Affected Utility's Standard Offer or in the competitive market." Access to TEP's transmission and distribution facilities for competitive purchases is effected through the DA rate schedules. By telling the University that access to TEP's distribution and transmission system for competitive service may result in the customer being forced to a higher-cost rate schedule than has applied to its Standard Offer service (i.e., the rate 13 series instead of the rate 14 series), TEP is clearly violating this fundamental Commission rule and its underlying principle of non-discrimination. It is a truly menacing gesture aimed at the heart of retail competition that should be quashed immediately by the Commission.
- Q. YOU INDICATED THAT TEP'S BEHAVIOR IS A VIOLATION OF ITS SETTLEMENT AGREEMENT. ON WHAT BASIS ARE YOU FAMILIAR WITH THE SETTLEMENT AGREEMENT?
- A. On behalf of Arizonans for Electric Choice and Competition (AECC), I helped to negotiate the Settlement Agreement. I then filed direct, rebuttal, and surrebuttal testimony that explained the settlement and recommended its adoption, and was cross-examined over a three-day period regarding its terms.
- Q. HOW DOES TEP'S ATTEMPT TO FORCE THE UNIVERSITY ON TO A HIGHER-COST RATE SCHEDULE VIOLATE THE SETTLEMENT AGREEMENT?

2		settlement is that every Standard Offer rate schedule is to have a direct counterpart DA
3		rate schedule. Accordingly, the DA-14 rate was created for Rate 14 customers. If TEP is
4		able to force customers out of this or any other rate class as retribution for taking direct
5		access service, the basic premise of the unbundled tariff design is rendered meaningless.
6	Q.	IS IT LEGITIMATE FOR TEP TO ASSERT THAT THE UNIVERSITY'S ELIGIBILITY FOR RATE 14 (OR DA-14) EXPIRES UPON THE TERMINATION
7		OF THEIR ELECTRIC SERVICE AGREEMENT (ESA) AND MUST BE "FRESHLY NEGOTIATED"?
8	A.	No. The "Availability" section of the DA-14 rate – which I negotiated as part of the
9		settlement - plainly states that it is "applicable to ESA (special contract) customers who,
10		after expiration of their contracts pursuant to the Company's Amended Settlement
11		Agreement, choose to take Direct Access service." Clearly, the DA-14 rate is to be
12		available to customers who were taking service under contracts at the same time the
13		Settlement Agreement was approved without any requirement that the other contract terms
14 15		be renegotiated.
16	Q.	IS THERE A DISTINCTION BETWEEN ESA CUSTOMERS WHOSE RATES ARE DETERMINED BY CONTRACT AND THOSE WHO ARE UNDER CONTRACTS INCORPORATING A TARIFF RATE SUCH AS RATE 14?
17	A.	Not for purposes of determining whether or not they are eligible for the DA-14 rate.
18 19	Q.	ARE THERE OTHER WAYS IN WHICH TEP'S POSITION IS INCONSISTENT WITH THE SETTLEMENT AGREEMENT?
20	A.	Yes. The core design of TEP's stranded cost recovery program is based on the
21		assumption that customers who choose direct access would pay the stranded cost charges
22		calculated for their current rate schedule. If, alternatively, customers are moved to higher-
23		cost rate schedules when they choose direct access (but whose character of service does
24		not otherwise change), TEP will receive a stranded cost windfall that the settlement does
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not contemplate.

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The Settlement Agreement is violated in several ways. First, a key requirement of the

A. No. First of all, the provision as interpreted by TEP would be a flagrant violation of the non-discrimination requirements in the Commission Rule and should be invalidated on those grounds alone. Moreover, Section 13.6 of the Settlement Agreement prohibits TEP from requesting changes in terms and conditions of service that materially modify the tariffs approved in the Settlement Agreement. The DA-14 rate in the Unbundled Tariffs approved as part of the Settlement Agreement contains the same language accommodating totalization as the Standard Offer Rate 14. For TEP to even attempt to nullify this tariff provision violates the Settlement Agreement.

Q. WHAT OTHER IMPEDIMENTS TO COMPETITION HAVE BEEN CAUSED BY THIS POSITION?

A. Customers need to be able to return to Standard Offer service under the same terms and conditions and under the same Standard Offer tariff as they left. Potential direct access customers simply will not elect direct access without this assurance. Otherwise, every TEP Standard Offer Rate 14 customer is under the threat that if they leave to test the competitive market, they will be forced to return on Rate 13. Although the specific tariff issue affecting the University is Rate 14, the principle should be generally applicable to all TEP tariffs. In fact, it was this very threat of retaliatory treatment by the incumbent provider under this sort of circumstance (return from direct access) that has severely thwarted all competition within the Salt River Project service territory. The Commission could not do anything about that situation – but it can here.

Q. IS THE ISSUE OF CUSTOMERS RETURNING TO STANDARD OFFER SERVICE PART OF A LARGER PROBLEM WITH TEP'S CURRENT RATE 14 "CONTRACT" LANGUAGE?

A. Yes. Because the tariff makes reference to a "contract" between TEP and the otherwise eligible customer, and given the large difference between Rate 14 and Rate 13, TEP has extraordinary leverage over a Rate 14 customer whose "contract" has expired.

Q. HAS THE COMMISSION ALREADY ADDRESSED THIS ISSUE WITH RESPECT TO ANOTHER UTILITY'S TARIFF?

A. Yes. The Commission addressed this matter with respect to APS' Rate 35 (which is analogous to TEP's Rate 14). Even though APS did not actually utilize nor threaten to utilize similar "contract" language in its Rate 35 to discourage direct access, the Commission nevertheless ordered the language deleted from that utility's tariff. In short, a customer who has been on a tariff rate that had required a contract for term prior to competition should be allow to remain on it throughout the transition period under the same terms and conditions.

Redundant metering requirements

- Q. PLEASE DESCRIBE THE SECOND OBSTACLE THAT TEP HAS ERECTED TO THWART THE UNIVERSITY'S ATTEMPT TO ACQUIRE DIRECT ACCESS SERVICE.
- A. Since 1995, the University has accommodated TEP and the UMC by allowing TEP to deliver energy to the UMC over the University's AHSC distribution facilities. TEP is using this unique circumstance as a pretext to insist that the University install extensive and unnecessary metering equipment if the University chooses to take direct access service.

Q. PLEASE ELABORATE.

A. Perhaps some background information will be helpful here. As I mentioned above, the AHSC is served by five feeders off the substation which are distributed to the various buildings that comprise the AHSC through the University's own distribution system.

There are five meters located at the substation that measure the energy usage on each of the five feeders exiting the substation.

Prior to 1995, TEP utilized the reads from the five substation feeder meters to determine the total AHSC load. No sub-metering of the individual components of that load was required. The five meter reads were simply combined for billing purposes pursuant to the AHSC's Rate 14 agreement. The UMC, which I noted earlier is a separate entity leasing buildings or portions of buildings within the AHSC, paid a pro-rated portion of the AHSC's bill under its lease arrangement with the University.

In 1995, UMC signed its own contract with TEP for electric service. At that time, TEP installed 38 meters to measure the UMC load within AHSC buildings. Since 1995, the combined reads from the 38 meters have been utilized by TEP to bill UMC. Through basic subtraction, these meters also used to measure the remaining AHSC load. For AHSC, TEP takes the sum of the reads from the five substation feeder meters and subtracts the combined reads of the 38 UMC reads to mathematically derive the total AHSC load. This resulting total AHSC load is then used to bill AHSC using Rate 14.

Q. HOW IS TEP USING THIS CURRENT METERING ARRANGEMENT TO CREATE AN OBSTACLE TO DIRECT ACCESS?

A. TEP is taking the position that the metering configuration that has been utilized to provide service since 1995 is not sufficient to meter the load of AHSC distinct from the UMC load if the University takes direct access service.

O. DO YOU AGREE WITH THIS POSITION?

A. No. It is apparent that TEP is trying to impose additional metering requirements and costs on the University in order to prevent the University from electing to take direct access service. The current arrangement, which for years has been adequate for standard offer service, is more than adequate to separately meter the AHSC load and comply with the metering requirements of the Competition Rules.

A.

Q. WHAT ADDITIONAL METERING REQUIREMENTS IS TEP PROPOSING?

TEP is requiring that the University's load be "separately measured" without any reliance on the existing 38 UMC meters. Conceptually, this TEP requirement could be addressed in one of two ways. The first approach would require the University to install meters that exactly duplicated the 38 meters already installed at UMC. These new 38 meters would replicate the subtraction function now being performed by the UMC meters. The only difference would be that the new meters would be "separately measuring" the University's load in accordance with TEP's requirements. The waste of customer dollars inherent in meeting this requirement by installing wholly redundant metering is obvious.

The second approach, however, is even more wasteful and onerous.

Under the second approach, the University would install new meters that did not simply measure the "exit points," as is now the case, but would separately measure each of the University's AHSC facilities at the point from which they take service. For example, if an existing UMC meter now measures the load for half of a floor that UMC is leasing from the University, TEP would require the University to install another meter to "separately measure" the other half of the floor. This process would be repeated for each of the other 37 UMC metering locations, but in addition, University would have to install even more meters to measure the sections of AHSC that are not shared with UMC.

Note that under the second approach, if one added the reads from the 38 UMC meters together with the 38+ new AHSC meters, it would total the reads of the five meters in the substation. Therefore, if one simply took the sum of the five substation meters and subtracted from it the reads of the existing 38 UMC meters, one would obtain the same results as would be produced by installing 38+ new AHSC meters.

Under either approach to meeting TEP's requirements, the installation of additional meters adds nothing but an unnecessary cost for the University – a cost that would prohibit the University from electing direct access.

Q. HAS THE EXACT NUMBER OF METERS AND THE ASSOCIATED COST IMPACT TO THE UNIVERSITY OF COMPLYING WITH TEP'S DEMANDS BEEN DETERMINED?

A. No. Although TEP has indicated that the existing metering configuration is somehow inadequate, it has never told either APS Energy Services or the University exactly how many additional and redundant meters it will require for direct access. APS Energy Services requested such information from TEP in a data request. TEP, in response to that data request, has stated that "To determine locations of each premise or specific service point necessary to separately meter AHSC's load requires a detailed site specific audit of the AHSC's facilities....TEP has not preformed such an audit." APS Energy Services has subsequently requested additional information from TEP regarding the timing and cost of such an audit. This lack of specificity notwithstanding, APS Energy Services has related to me that TEP has indicated in conversations that it believes the additional metering would cost the University at least \$250,000.

Q. WHAT METERING ARRANGEMENT FOR THE AHSC ARE YOU RECOMMENDING THAT THE COMMISSION AUTHORIZE AND WHY?

A. The metering at the AHSC is a unique situation created by TEP's electing to serve the UMC independently. I am recommending that the AHSC, if it elects to go direct access, should continue to have its usage measured by totaling the meter readings at the substation and subtracting the reads of the 38 UMC meters. The ESP that AHSC chooses, whether APS Energy Services or another ESP, would, of course install their own meters in place of the TEP-owned meters at the substation. Then, with the express written authorization of the UMC, TEP would provide hourly meter data from UMC's 38 existing Standard Offer service meters, to the University and/or to its selected ESP. In addition to furnishing the

substation feeder meters, the University and/or its ESP would fully compensate TEP for any incremental cost it incurs to develop the hourly reads or to upgrade the existing meters to provide hourly data through telephone lines, which lines would also be paid for by the University and/or its ESP. If TEP prefers to bill UMC directly for the increase in metering costs, these would be reimbursed to UMC by the University and/or its ESP.

It is not unusual for utilities to provide detailed information, such as hourly reads, to the customer at the customer's request, either free of charge or for the incremental costs incurred. UMC has the right to request such data be provided to the University.

Moreover, in this particular circumstance, the University has a right to know what amount of load is exiting their distribution system for service to TEP's customer – the UMC.

Summary of recommendations

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS TO THE COMMISSION.

- A. I recommend that the Commission expressly find:
 - 1. Any customer that elects direct access should have both the right to take direct access service on the complementary unbundled version of the customer's current standard offer tariff and the right to return to that same standard offer tariff. The tariff availability is at the discretion of the customer, not TEP. Additionally, if the standard offer tariff (or any contract pursuant to a tariff) had provided for or permitted the combining of metering points for billing purposes, it should continue under direct access. TEP's Rules and Regulations on totalized metering do not prevent totalized billing and in any event, should not apply to situations in which the use of multiple delivery points benefits the UDC.
 - 2. A customer on either a standard offer or direct access tariff has the right to remain on that tariff under the same terms and conditions until the

Commission changes such terms and conditions or the customer's eligibility for that tariff.

- 3. Under the Electric Competition Rules, the current metering points at the University and UMC are sufficient to accommodate allowing the University to go direct access and fully compensate TEP. The metering was sufficient for TEP to serve both loads for Standard Offer service. Therefore, it is sufficient for direct access.
- 4. With the express authorization of UMC, TEP is obligated to provide hourly meter data to the University and to others that are authorized by the University and UMC in the manner prescribed in the Competition Rules. TEP should be compensated for the actual incremental costs of providing this data. The University, with the UMC's authorization, has a right to the load data exiting its distribution system. Since the data is being provided at UMC's request is Standard Offer metering data, it cannot be considered a competitive service.
- Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?
- A. Yes, it does.

KEVIN C. HIGGINS Principal, Energy Strategies, L.L.C. 39 Market St., Suite 200, Salt Lake City, UT 84101 (801) 355-4365

Vitae

PROFESSIONAL EXPERIENCE

<u>Principal</u>, Energy Strategies, L.L.C., Salt Lake City, Utah, January 2000 to present. Responsible for energy-related economic and policy analysis, regulatory intervention, and strategic negotiation on behalf of industrial, commercial, and public sector interests. Previously <u>Senior Associate</u>, February 1995 to December 1999.

Adjunct Instructor in Economics, Westminster College, Salt Lake City, Utah, September 1981 to May 1982; September 1987 to May 1995. Taught in the economics and M.B.A. programs. Awarded Adjunct Professor of the Year, Gore School of Business, 1990-91.

Chief of Staff to the Chairman, Salt Lake County Board of Commissioners, Salt Lake City, Utah, January 1991 to January 1995. Senior executive responsibility for all matters of county government, including formulation and execution of public policy, delivery of approximately 140 government services, budget adoption and fiscal management (over \$300 million), strategic planning, coordination with elected officials, and communication with consultants and media.

Assistant Director, Utah Energy Office, Utah Department of Natural Resources, Salt Lake City, Utah, August 1985 to January 1991. Directed the agency's resource development section, which provided energy policy analysis to the Governor, implemented state energy development policy, coordinated state energy data collection and dissemination, and managed energy technology demonstration programs. Position responsibilities included policy formulation and implementation, design and administration of energy technology demonstration programs, strategic management of the agency's interventions before the Utah Public Service Commission, budget preparation, and staff development. Supervised a staff of economists, engineers, and policy analysts, and served as lead economist on selected projects.

<u>Utility Economist</u>, Utah Energy Office, January 1985 to August 1985. Provided policy and economic analysis pertaining to energy conservation and resource development, with an emphasis on utility issues. Testified before the state Public Service Commission as an expert witness in cases related to the above.

Acting Assistant Director, Utah Energy Office, June 1984 to January 1985. Same responsibilities as Assistant Director identified above.

Research Economist, Utah Energy Office, October 1983 to June 1984. Provided economic analysis pertaining to renewable energy resource development and utility issues. Experience includes preparation of testimony, development of strategy, and appearance as an expert witness for the Energy Office before the Utah PSC.

Operations Research Assistant, Corporate Modeling and Operations Research Department, Utah Power and Light Company, Salt Lake City, Utah, May 1983 to September 1983. Primary area of responsibility: designing and conducting energy load forecasts.

<u>Instructor in Economics</u>, University of Utah, Salt Lake City, Utah, January 1982 to April 1983. Taught intermediate microeconomics, principles of macroeconomics, and economics as a social science.

<u>Teacher</u>, Vernon-Verona-Sherrill School District, Verona, New York, September 1976 to June 1978.

EDUCATION

Ph.D. Candidate, Economics, University of Utah (coursework and exams completed, 1981).

Fields of Specialization: Public Finance, Urban and Regional Economics, Economic Development, International Economics, History of Economic Doctrines.

Bachelor of Science, Education, State University of New York at Plattsburgh, 1976 (cum laude).

Danish International Studies Program, University of Copenhagen, 1975.

SCHOLARSHIPS AND FELLOWSHIPS

University Research Fellow, University of Utah, Salt Lake City, Utah 1982 to 1983. Research Fellow, Institute of Human Resources Management, University of Utah, 1980 to 1982. Teaching Fellow, Economics Department, University of Utah, 1978 to 1980. New York State Regents Scholar, 1972 to 1976.

EXPERT TESTIMONY

"In the Matter of the Application of Questar Gas Company for an Increase in Rates and Charges," Utah Public Service Commission, Docket No. 99-057-20. Direct testimony submitted April 19, 2000. Rebuttal testimony submitted May 24, 2000. Surrebuttal testimony submitted May 31, 2000. Cross-examined June 6 & 8, 2000.

"In the Matter of the Application of Columbus Southern Power Company for Approval of Electric Transition Plan and Application for Receipt of Transition Revenues," Public Utility Commission of Ohio, Case No. 99-1729-EL-ETP; "In the Matter of the Application of Ohio Power Company for Approval of Electric Transition Plan and Application for Receipt of Transition Revenues," Public Utility Commission of Ohio, Case No. 99-1730-EL-ETP. Direct testimony prepared, but not submitted pursuant to settlement agreement effected May 2, 2000.

"In the Matter of the Application of FirstEnergy Corp. on Behalf of Ohio Edison Company, The Cleveland Electric Illuminating Company, and the Toledo Edison Company for Approval of Their Transition Plans and for Authorization to Collect Transition Revenues," Public Utility Commission of Ohio, Case No. 99-1212-EL-ETP. Direct testimony prepared, but not submitted pursuant to settlement agreement effected April 11, 2000.

"2000 Pricing Process," Salt River Project Board of Directors, oral comments provided March 6, 2000 and April 10, 2000.

"Tucson Electric Power Company vs. Cyprus Sierrita Corporation," Arizona Corporation Commission, Docket No. E-000001-99-0243. Direct testimony submitted October 25, 1999. Cross-examined November 4, 1999.

"Application of Hildale City and Intermountain Municipal Gas Association for an Order Granting Access for Transportation of Interstate Natural Gas over the Pipelines of Questar Gas Company for Hildale, Utah," Utah Public Service Commission, Docket No. 98-057-01. Rebuttal testimony submitted August 30, 1999.

"In the Matter of the Application by Arizona Electric Power Cooperative, Inc. for Approval of Its Filing as to Regulatory Assets and Transition Revenues," Arizona Corporation Commission, Docket No. E-01773A-98-0470. Prefiled direct testimony submitted July 30, 1999. Cross examined February 28, 2000.

"In the Matter of the Application of Tucson Electric Power Company for Approval of its Plan for Stranded Cost Recovery," Arizona Corporation Commission, Docket No. E-01933A-98-0471; "In the Matter of the Filing of Tucson Electric Power Company of Unbundled Tariffs Pursuant to A.A.C. R14-2-1601 et seq.," Docket No. E-01933A-97-0772; "In the Matter of the Competition in the Provision of Electric Service Throughout the State of Arizona," Docket No. RE-00000C-94-0165. Prefiled direct testimony submitted June 30, 1999. Rebuttal testimony submitted August 6, 1999. Cross-examined August 11-13, 1999.

"In the Matter of the Application of Arizona Public Service Company for Approval of its Plan for Stranded Cost Recovery," Arizona Corporation Commission, Docket No. E-01345A-98-0473; "In the Matter of the Filing of Arizona Public Service Company of Unbundled Tariffs Pursuant to A.A.C. R14-2-1601 et seq.," Docket No. E-01345A-97-0773; "In the Matter of the Competition in the Provision of Electric Service Throughout the State of Arizona," Docket No.

RE-00000C-94-0165. Prefiled direct testimony submitted June 4, 1999. Rebuttal testimony submitted July 12, 1999. Cross-examined July 14, 1999.

"In the Matter of the Application of Tucson Electric Power Company for Approval of its Plan for Stranded Cost Recovery," Arizona Corporation Commission, Docket No. E-01933A-98-0471; "In the Matter of the Filing of Tucson Electric Power Company of Unbundled Tariffs Pursuant to A.A.C. R14-2-1601 et seq.," Docket No. E-01933A-97-0772; "In the Matter of the Application of Arizona Public Service Company for Approval of its Plan for Stranded Cost Recovery," Docket No. E-01345A-98-0473; "In the Matter of the Filing of Arizona Public Service Company of Unbundled Tariffs Pursuant to A.A.C. R14-2-1601 et seq.," Docket No. E-01345A-97-0773; "In the Matter of the Competition in the Provision of Electric Service Throughout the State of Arizona," Docket No. RE-00000C-94-0165. Prefiled direct testimony submitted November 30, 1998.

"Hearings on Pricing," Salt River Project Board of Directors, written and oral comments provided November 9, 1998.

"Hearings on Customer Choice," Salt River Project Board of Directors, written and oral comments provided June 22, 1998; June 29, 1998; July 9, 1998; August 7, 1998; and August 14, 1998.

"In the Matter of the Competition in the Provision of Electric Service Throughout the State of Arizona," Arizona Corporation Commission, Docket No. U-0000-94-165. Direct and rebuttal

testimony filed January 21, 1998. Second rebuttal testimony filed February 4, 1998. Cross-examined February 25, 1998.

"In the Matter of Consolidated Edison Company of New York, Inc.'s Plans for (1) Electric Rate/Restructuring Pursuant to Opinion No. 96-12; and (2) the Formation of a Holding Company Pursuant to PSL, Sections 70, 108, and 110, and Certain Related Transactions," New York Public Service Commission, Case 96-E-0897. Testimony filed April 9, 1997. Cross-examined May 5, 1997.

"In the Matter of the Petition of Sunnyside Cogeneration Associates for Enforcement of Contract Provisions," Utah Public Service Commission, Docket No. 96-2018-01. Prefiled direct testimony submitted July 8, 1996.

"Questar Pipeline Company," Federal Energy Regulatory Commission, Docket No. RP95-407. Direct testimony prepared, but withheld subject to settlement. Settlement approved July 1, 1996.

"In the Matter of Arizona Public Service Company's Rate Reduction Agreement," Arizona Corporation Commission, Docket No. U-1345-95-491. Direct testimony prepared, but withheld consequent to issue resolution. Agreement approved April 18, 1996.

"In the Matter of the Application of PacifiCorp, dba Pacific Power & Light Company, for Approval of Revised Tariff Schedules and an Alternative Form of Regulation Plan," Wyoming Public Service Commission, Docket No. 2000-ER-95-99. Prefiled direct testimony submitted April 8, 1996.

"In the Matter of the Application of Mountain Fuel Supply Company for an Increase in Rates and Charges," Utah Public Service Commission, Case No. 95-057-02. Prefiled direct testimony submitted June 19, 1995. Rebuttal testimony submitted July 25, 1995. Surrebuttal testimony submitted August 1995.

"In the Matter of the Investigation of the Reasonableness of the Rates and Tariffs of Mountain Fuel Supply Company," Utah Public Service Commission, Case No. 89-057-15. Pre-filed direct testimony submitted July 1990. Surrebuttal testimony submitted August 1990.

"In the Matter of the Review of the Rates of Utah Power and Light Company pursuant to The Order in Case No. 87-035-27," Utah Public Service Commission, Case No. 89-035-10. Rebuttal testimony submitted November 15, 1989; cross-examined December 1, 1989 (rate schedule changes for state facilities).

"In the Matter of the Application of Utah Power & Light Company and PC/UP&L Merging Corp. (to be renamed PacifiCorp) for an Order Authorizing the Merger of Utah Power & Light Company and PacifiCorp into PC/UP&L Merging Corp. and Authorizing the Issuance of Securities, Adoption of Tariffs, and Transfer of Certificates of Public Convenience and Necessity and Authorities in Connection Therewith," Utah Public Service Commission, Case No. 87-035-27; prefiled direct testimony submitted April 11, 1988; cross-examined May 12, 1988 (economic impact of UP&L merger with PacifiCorp).

"In the Matter of the Application of Mountain Fuel Supply Company for Approval of Interruptible Industrial Transportation Rates," Utah Public Service Commission, Case No. 86-057-07. Prefiled direct testimony submitted January 15, 1988; cross-examined March 30, 1988.

"In the Matter of the Application of Utah Power and Light Company for an Order Approving a Power Purchase Agreement," Utah Public Service Commission, Case No. 87-035-18. Oral testimony delivered July 8, 1987.

"Cogeneration: Small Power Production," Federal Energy Regulatory Commission, Docket No. RM87-12-000. Statement delivered March 27, 1987, on behalf of State of Utah, in San Francisco.

"In the Matter of the Investigation of Rates for Backup, Maintenance, Supplementary, and Standby Power for Utah Power and Light Company," Utah Public Service Commission, Case No. 86-035-13; prefiled direct testimony submitted January 5, 1987. Case settled by stipulation approved August 1987.

"In the Matter of the Application of Sunnyside Cogeneration Associates for Approval of the Cogeneration Power Purchase Agreement," Utah Public Service Commission, Case No. 86-2018-01. Rebuttal testimony submitted July 16, 1986; cross-examined July 17, 1986.

"In the Matter of the Investigation of Demand-Side Alternatives to Capacity Expansion for Electric Utilities," Utah Public Service Commission, Case No. 84-999-20. Prefiled direct testimony submitted June 17, 1985. Prefiled rebuttal testimony submitted July 29, 1985; Crossexamined August 19, 1985.

"In the Matter of the Implementation of Rules Governing Cogeneration and Small Power Production in Utah," Utah Public Service Commission, Case No. 80-999-06, pp. 1293-1318. Prefiled testimony submitted January 13, 1984 (avoided costs), May 9, 1986 (security for levelized contracts) and November 17, 1986 (avoided costs); cross-examined February 29, 1984

(avoided costs), April 11, 1985 (standard form contracts), May 22-23, 1986 (security for levelized contracts) and December 16-17, 1986 (avoided costs).

OTHER RELATED ACTIVITY

Board of Directors, ex-officio, Desert STAR ISO, September 1999 to present.

Advisory Committee, Desert STAR ISO, September 1999 to present.

Board of Directors, Arizona Independent Scheduling Administrator Association, October 1998 to present.

Acting Chairman, Operating Committee, Arizona Independent Scheduling Administrator Association, October 1998 to June 1999.

Member, Desert Star ISO Investigation Working Groups: Operations, Pricing, and Governance, April 1997 to present. Legal & Negotiating Committee, April 1999 to December 1999.

Participant, Independent System Operator and Spot Market Working Group, Arizona Corporation Commission, April 1997 to September 1997.

Participant, Unbundled Services and Standard Offer Working Group, Arizona Corporation Commission, April 1997 to October 1997.

Participant, Customer Selection Working Group, Arizona Corporation Commission, March 1997 to September 1997.

Member, Stranded Cost Working Group, Arizona Corporation Commission, March 1997 to September 1997.

Member, Electric System Reliability & Safety Working Group, Arizona Corporation Commission, November 1996 to present.

Consultant to business customers, "In the Matter of Competition in the Provision of Electric Services Throughout the State of Arizona," Arizona Corporation Commission, Docket No. U-0000-94-165. Preparation of comments and participation in staff workshops. Rule on retail electric competition adopted December 23, 1996.

Chairman, Salt Palace Renovation and Expansion Committee, Salt Lake County/State of Utah/Salt Lake City, multi-government entity responsible for implementation of planning, design, finance, and construction of an \$85 million renovation of the Salt Palace Convention Center, Salt Lake City, Utah, May 1991 to December 1994.

State of Utah Representative, Committee on Regional Electric Power Cooperation, a joint effort of the Western Interstate Energy Board and the Western Conference of Public Service Commissioners, January 1987 to December 1990.

Member, Utah Governor's Economic Coordinating Committee, January 1987 to December 1990.

Chairman, Standard Contract Task Force, established by Utah Public Service Commission to address contractual problems relating to qualifying facility sales under PURPA, March 1986 to December 1990.

Chairman, Load Management and Energy Conservation Task Force, Utah Public Service Commission, August 1985 to December 1990.

Alternate delegate for Utah, Western Interstate Energy Board, Denver, Colorado, August 1985 to December 1990.

Articles Editor, Economic Forum, September 1980 to August 1981.